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ABSTRACT

Intended as a resource for program developers, this handbook illustrates the process of developing program proposals for the associate of applied science and business (AASB) degrees at Lima Technical College (LTC), in Ohio. Following an introduction, section 1 discusses the potential reasons for the addition of a program to the LTC curriculum. Section 2 provides Ohio Board of Regents check sheets for gaining approval of two-year AASB degrees and two-year programs in general. Section 3 presents an overview of 33 steps in developing an AASB program; reviews the role of advisory committees in the process; and provides discussions of the goals of curriculum development for applied technical degrees, undertaking needs assessments, and cost considerations for new programs. Section 4 reviews the completion of the proposal, including the submission of preliminary and formal proposals, and provides helpful hints for submitting the formal proposal. The final two sections contain a glossary of terms and references. Appendixes provide sample materials related to the development of an asphalt and concrete technology program, including an agenda from a planning meeting, a description of advisory committee activities, a list of program and coordinator skills and competencies, a needs survey instrument, and the Ohio Board of Regents operating manual for two-year campus programs. Contains 13 references. (TGI)

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HANDBOOK FOR PROGRAM DEVELOPERS OF ASSOCIATE OF APPLIED SCIENCE AND BUSINESS DEGREES AT

LIMA TECHNICAL COLLEGE

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Spring 1996

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INTRODUCTION

INTRODUCTION

An attribute of two-year colleges is the ability to quickly respond to local workforce development needs by providing customized educational experiences in the form of credit and noncredit instructional programming. Two-year colleges are valued for their abilities to identify the unmet needs of their communities and to muster the resources and support necessary to satisfy these needs through programs of study leading to associate of applied science and associate of applied business degrees.

The journey between the identification of program need and student matriculation can be troublesome and at times lengthy. As institutions expected to respond in the shortest possible time, two-year colleges must have well-established procedures and guidelines that: (a) minimize development time and (b) maximize quality curriculum development.

This handbook has been created to assist with developing program proposals for submission to the Ohio Board of Regents. The emphasis is on associate of applied science and business degree development at Lima Technical College. Other kinds of degree programs may also require formal internal approval of the college before submission to the Regents. For example, new technical majors as well as programs that award the associate of technical or associate of individualized study degrees must be submitted to the Regents for approval. For complete instructions on degree and program requirements please see the Ohio Board of Regents Operating Manual for Two-Year Campus Programs. Keep in mind that this handbook does not replace a working knowledge of the two-year campus manual which can be gotten through the vice president for instruction at the college. Use this handbook to supplement the preparation of program proposals.

Before starting the proposal, you are invited to turn to section two of the manual to review the check sheet for two-year program approval. The check sheet should be used as a

terminal activity just prior to sending the proposal to the Regents. The check sheet describes the minimal elements required of any formal proposal. Knowing these elements beforehand may help to ensure complete, fully developed, well-written formal submissions. The reader should return to section one for a discussion of potential reasons for program development. The reader is then invited to review the glossary of terms found in section five of the handbook. The glossary provides many definitions and explanations that should speed proposal development.

Section three of the handbook describes the steps to program development. This section includes a discussion of advisory committees, thoughts on completing a formal needs assessment, instructions for developing the program's curriculum, and a section on how physical facilities may be affected by the addition of the program. Furthermore, an instrument for program development (quick overview for program developers) is provided as a tool containing 33 itemized steps. Readers are invited to carefully review the tool before starting the development process as it integrates college procedures with those of the Regents.

Section four provides helpful hints and instructions on how to complete the preliminary and formal proposals for program development. Section six lists the references used in preparing this manual. The appendix, which includes examples of Regents' forms and other documents, follows section six.

SECTION ONE

POTENTIAL REASONS FOR THE ADDITION TO THE CURRICULUM AT

LIMA TECHNICAL COLLEGE

SECTION ONE

Potential Reasons For The Addition To The Curriculum at Lima Technical College

Many things can cause college faculty and administrators to begin thinking about new program development. The economy of the local region may signal the need for new programs in specific technologies as well as labor market changes or new and emerging technologies. The needs of business and industry have been and are today a telling influence on new program development. The history of such influences can be traced to the 1800s where according to Rudolph (1995) Boston merchants put pressure on Harvard to change the curriculum and add "orthodox economics, the natural sciences, and useful social sciences" (p. 13). In 1894, the General Electric Company, provided an expanded curriculum to Union College as a gift.

The state of Ohio is committed to the economic development of its regions and sees a direct cause and effect relationship between the health of business and industry and the capacity of its two-year college system to deliver workforce training and education. The six statewide priorities of the Ohio Board of Regents, its push for high performance campuses, and the two-year campus service expectations are direct evidence of this important linkage (Ohio Board of Regents [OBOR], July 1992; OBOR, Dec. 1992; OBOR, Feb. 1995).

It is often necessary to articulate the reasons for the development of new programs. Keep in mind that a formal needs assessment will be conducted as part of the formal proposal for program approval. A needs assessment should provide definitive evidence for a new program; initially the college may not have such evidence. The following may serve to catalyze development of a preliminary proposal for program approval. Items from the list may be enough to generate interest in conceptualizing a new program. Some of the items can be seen as potential program objectives.

- To improve local access to education and training
- To satisfy state government prerogatives
- To help satisfy statewide employment needs
- To satisfy state mandated training requirements
- To provide unique statewide programming
- To help satisfy a perceived emerging workforce need
- To fulfill community needs, expectations, wants, and desires
- To satisfy expectations for state-of-the-art equipment and training
- To meet the challenge of changing and emerging technologies
- To provide extensive technical knowledge not readily available in the area
- To answer inquiries as to whether the college offers the program
- Applications which request the program
- Requests by business and industry
- Requests by unions or professional organizations
- Transferability of such a program to four-year units
- A large pool of general prep students at Lima Technical College
- To balance student demand with employer need
- To satisfy any of the 22 customer segments of the college
- To satisfy the particular needs of a specific customer segment of the college
- To meet labor market changes
- To fill the gap created by closure of a nearby program
- As a result of local demographics
- The likelihood of good placement data
- To provide service to other campus programs
- Potentially good retention rates for the new program
- To increase the level of education in a particular field of study

As an example, Lima Technical College (LTC) initiated its effort to develop a two-year associate degree program in Asphalt and Concrete Technology when the owner of a local construction company approached LTC's president. The owner expressed the need for a trained workforce capable of handling new and emerging technologies associated with highway construction. The expressed need was for qualified persons to serve as mix design specialists, inspectors, construction cost estimators, and for those qualified to operate complex testing and application equipment such as nuclear asphalt content and density gauges. Subsequently, the college formed an advisory committee to help in the development and formal assessment of need.

SECTION TWO

CHECK SHEET FOR TWO-YEAR PROGRAM APPROVAL BY THE OHIO BOARD OF REGENTS

ASSOCIATE OF APPLIED SCIENCE AND BUSINESS DEGREES ONLY

SECTION TWO

Check Sheet for Two-year Program Approval by Ohio Board of Regents Associate of Applied Science or Business Degrees Only

The check sheet for two-year program approval is an aggregate of various requirements found throughout the Ohio Board of Regents Operating Manual for Two-Year Campus Programs. Each item on the sheet is related to a Regents' requirement and is worded as a question to be answered by the developer of the proposal.

The check sheet is best used as a summative evaluation tool that can help ensure completeness of the proposal. The proposal's author should check that each item and its minimal requirements have been addressed within the proposal document before sending the request to the Regents.

Although the check sheet is a terminal activity, the reader is encouraged to review the list of requirements before beginning proposal development. Knowing the requirements beforehand may help to ensure full compliance.

Please note that the check sheet is not meant to take the place of the two-year campus manual but to supplement its use. The check sheet does not replace a working knowledge of the two-year campus manual.

Check Sheet for Two-Year Program Approval
by Ohio Board of Regents
Associate of Applied Science or Business Degree Only

Proposal Logistics and Preparation:

1. [] Has the program been submitted and did it receive preliminary approval from the Board of Regents?
2. [] Was a local assessment conducted to determine short and long-term needs for the proposed program?
3. [] Were statewide manpower needs considered during proposal development?
4. [] Are the physical facilities of the college adequate to support the proposed program of study (OBOR, p. 202.01, 1996)?
5. [] Has a technical program title been assigned in accordance with the adopted CIP code classifications (see Appendix E, OBOR Manual for Two-Year Campus Programs)?
6. [] Is the minimum projected, first-year enrollment at least 15 students (OBOR, p. 302.01, 1996)?
7. [] Is the second-year enrollment projected to be at least 12 students (OBOR, p. 302.01, 1996)?
8. [] Are at least eight students projected to graduate from the program by the end of the fourth year (OBOR, p. 302.01, 1996)?
9. [] Will 75% of the program's graduates be placed in technically related employment (OBOR, p. 302.01, 1996)?
10. [] Has an advisory committee been appointed and will it contribute to program development and evaluation (OBOR, p. 6, Appendix A, 1996)?
11. [] Are 10 copies of the formal proposal being sent to the Regents?
12. [] Were other institutions offering the same or similar programs of study consulted within a 30-mile radius (OBOR, p. 402.01, 1996).
13. [] If the same program is offered elsewhere in the state, was a consult held with the other program (OBOR, p. 402.01, 1996)?
14. [] Were all institutional approvals obtained before completing the formal proposal (OBOR, p. 402.01, 1996)?

Faculty Members:

15. [] Will at least one full-time faculty member, be employed to provide program leadership (OBOR, p. 302.01, 1996)? The Regents recommend that persons holding top leadership responsibilities at the department level should hold either a master's degree, or a bachelor's degree with other advanced preparation, and have experience in the appropriate field of concentration (OBOR, p. 3, Appendix A, 1996).
16. [] Is sixty-percent of curriculum taught by faculty members who devote full-time to the teaching and administrative responsibilities of the two-year campus (OBOR, p. 3, Appendix A, 1996)?

Please remove and photocopy. Use as a check sheet.

Check Sheet for Two-Year Program Approval
by Ohio Board of Regents
Associate of Applied Science or Business Degrees Only

Curriculum:

17 [] Were curricular objectives determined?

18. [] Are at least 90 quarter (60 semester) hours of study required for degree (OBOR, p. 4, Appendix A, 1996)?

19. [] Are there no greater than 110 quarter (73 semester) hours of study required for the degree exclusive of physical education (OBOR, p. 4, Appendix A, 1996)?

20. [] Are there no more than seven quarters of full-time study required for degree program (OBOR, p. 4, Appendix A, 1996)?

21. [] Are academic quarters no greater than 11 weeks in duration (10 weeks' instruction) or semesters no greater than 16 weeks in duration (15 instructions) (OBOR, p. 4, Appendix A, 1996)?

22. [] For **applied science and business degrees,** are there at least 45 quarter or 30 semester credit hours of course work identified with technical skills (OBOR, p. 5, Appendix A, 1996)? Technical studies courses should not consume more than 50% of the entire curriculum.

23. [] Do the technical courses include laboratory experiences?

24. [] Are technical courses distributed evenly throughout the two-year degree program?

25. [] For **applied science and business degrees,** are there at least 42 quarter or 28 semester credit hours of course work identified as non-technical general and basic (related) studies (OBOR, p. 5, Appendix A, 1996)? Approximately one-half of the curricula should be devoted to non-technical courses.

26. [] Does the general study portion of the curriculum consist of written communication, oral communication, social/behavioral science, humanities, mathematics, natural science and computer science (OBOR, p. 5, Appendix A, 1996)?

27. [] Does the basic (related) studies component of the curriculum consist of non-technical courses or courses other than written and oral communication, social/behavioral science, humanities, mathematics, natural science, and computer science (OBOR, p. 5, Appendix A, 1996)?

28. [] Are the general and basic study portions of the curriculum transferable (OBOR, p. 302.01, 1996)?

Other:

29. [] Will this new program replace any existing programs of study?

30. [] What in-kind or financial support has been dedicated to supporting this new program addition?

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SECTION THREE

STEPS FOR PROGRAM DEVELOPMENT

Quick Overview for Program Developers of Associate of Applied Science and Applied Business Degrees at Lima Technical College

Steps for program development at Lima Technical College.

1. [] Faculty members and senior administration as well as nonteaching professional staff members should continually scan the college's operating environments for program concepts that may satisfy local, regional, or state needs. In actuality, any faculty or staff member may share an abstract idea of a program concept.
2. [] Once an abstraction is identified, conceptualize the potential new program.
3. [] Share the concept with the chair or dean of the appropriate college division or department. If the concept has merit, the chair or dean will consult with faculty members to elicit their thoughts and opinions.
   Note: It will be helpful to maintain a chronology of activities spanning the period from conceptualization to submission of the formal proposal. The Regents request a description of advisory committee contributions when formal proposals are eventually submitted.
4. [] Share the concept with the vice president for instruction to obtain permission to proceed with need identification.
5. [] The dean or chair, and in some cases the special assistant to the president, will begin the process of identifying demand and need for the program concept.
6. [] Identify one or two persons from business, industry, health care, or the service sector who would be willing to share their expertise by discussing the program concept. These persons need to be closely related to or directly involved in the career area most likely to employ graduates.
7. [] Gather anecdotal evidence of demand or need from the identified experts.
8. [] Perform search for relevant literature to support anecdotal evidence of need or demand.
9. [] Discuss anecdotal evidence and results of literature search with the vice president to determine further action.
10. [] With the help of industry experts, identify and visit potential graduate employment sites.
11. [] The vice president for instruction shall discuss the program concept with the president. Anecdotal evidence of program need and demand will be shared with the president. Request support from the president.
12. [] If further action is warranted, discuss the program concept as well as evidence gathered in support of the concept with the vice president for enrollment management and the vice president for business.
13. [] If evidence warrants further development, request clearance to proceed from appropriate dean, chair, or vice president for instruction.
14. [] Request that the vice president for instruction place the program concept on the agenda of the academic affairs committee.
15. [] Submit request for preliminary program approval to the Ohio Board of Regents (OBOR). See Ohio Board of Regents Operating Manual for Two-Year Campus Programs, page 401.01. Contact the office of vice president for instruction to review the manual.

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Note: Preliminary requests will be distributed to the Two-Year Campus Leadership for discussion. Concerns about the preliminary proposal from two-year campus leaders will be shared with the Regents' staff at the OBOR. The Regents' staff will inform Lima Technical College (LTC) of the action which has been taken on its request.

16. [] If preliminary approval is granted, the college is free to begin the process of formal proposal development. If approval is temporarily withheld, the college may be required to submit further information or to consult with the Regents staff.
Note: Preliminary approval will be withdrawn if a formal proposal has not been submitted to the Board of Regents within two-years of the date of preliminary approval.

17. [] Begin formal proposal process by forming a local advisory committee comprised of persons who are not employed by the college and who are closely related to or directly employed in the career area most likely to employ graduates of the program. Some or all of the following may be good choices: (a) employers, (b) representatives of trade or professional organizations, (c) business owners, (d) human resource directors from the related industry, (e) managers and/or supervisors, (f) industry consultants, etc. Experts identified in step six may be helpful in creating a potential list of possibilities. It is very important to maintain complete minutes of all activities. These minutes will be submitted with the formal proposal to the Regents.
Note: Some occupational fields require concurrent submission of applications to their accrediting bodies for approval to proceed with program development. These proposals may necessitate the hiring of consultants to develop the applications. In some cases full-time program personnel must be hired as part of the application process. In short, external agencies may be part of the program development process as well as the Board of Regents. To determine if this is the case, consult with identified industry experts or with other similar programs established at other colleges or universities.

18. [] Form curriculum subcommittee of the advisory group that will work with assigned faculty members and/or the appropriate dean or chairperson to develop: (a) a list of technical and social competencies that are related to needed workplace skills, (b) the goals and objectives of the potential program, and (c) the curriculum to include course content and sequencing as well as course descriptions. In the case of health technologies, competencies must reflect the realities of licensure, credentialling, and/or accrediting bodies. It is very important to maintain complete minutes of all activities. These minutes will be submitted with the formal proposal to the Regents.

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19. [] Form facilities and equipment subcommittee of the advisory group that will work to identify potential sources of equipment donations. This subcommittee should attempt to articulate all the equipment needs of the program under development. It is very important to maintain complete minutes of all activities. These minutes will be submitted with the formal proposal to the Regents.

20. [] Form a subcommittee of the advisory group to help in the determination of formal needs and demands. This group shall work with college personnel and faculty members to design a process by which to study the industry demand for the type and kind of student expected to graduate from the program. According to the Board of Regents student demand and interest for the program must be assessed and evaluated as well.

    Note: This group can be most helpful in sharing industry mailing lists that, when used, can help ensure adequate sampling of the industry's cross-section. This group may also be helpful in writing and developing the survey instrument and methodologies. It is very important to maintain complete minutes of all activities. These minutes will be submitted with the formal proposal to the Regents.

21. [] College personnel should consult with other institutions either public or private, profit or not-for-profit, that offer the same or similar program of study. The primary purpose is to determine program duplication. The Regents require a survey of similar programs within a 30-mile radius of the college to determine program duplication (OBOR, 1996).

22. [] If it is determined that the program is offered elsewhere in the state of Ohio, then a consult with that campus is recommended. Phone consultation may satisfy this element of the proposal process but a personal visit will improve the understanding.

    Note: It may be helpful to inquire about enrollment patterns and employment of graduates. An understanding of program marketing strategies would be most useful when recruiting students.

23. [] Discuss costs and physical facility requirements with the vice president for business. Provide enrollment projections to the vice president and request that the financial impact statement be completed, see page 402.09 of the Ohio Board of Regents Operating Manual for Two-Year Campus Programs. This statement is to be included as part of the formal proposal to the Regents.

24. [] Prepare formal proposal in accordance section 402.03 - 402.09 of the Ohio Board of Regents Operating Manual for Two-Year Campus Programs.

    Note: Instructions for completing this section as well as helpful hints on curriculum design and conducting a formal needs assessment can be found in section three of this handbook.

25. [] Submit first draft of formal proposal to the vice president for instruction. Request comment and approval.

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26. [] The vice president for instruction shall submit formal proposal to the president for approval.
27. [] The vice president for instruction shall submit formal proposal to the academic affair's committee for approval.
28. [] The dean, chair, or special assistant to the president shall submit the formal proposal to the program's advisory committee. A motion of support shall be requested from the program's advisory committee.
29. [] The president, in concurrence with the vice president for instruction, shall request approval from the college's board of trustees.
30. [] Once all internal approvals have been secured, submit the formal proposal to the Ohio Board of Regents.
    Note: The Regents request that formal proposals be submitted only after all internal approvals have been secured as well as approval by the board of trustees, if appropriate. Ten copies of the proposal shall be submitted.
31. [] The proposal will be reviewed by the Regents' staff who may seek the advice of consultants or that of other advisory committees to confirm the needs (OBOR, 1996).
    Note: Manpower needs on a statewide basis will be used as a criterion for program approval.
32. [] Once a determination has been made by the Regents a recommendation will be made for approval or disapproval to the Chancellor of the Ohio Board of Regents. The college will be given an opportunity to present a statement of position on the matter during the Regents Board meeting.
    Note: The Regents Board will consider the Chancellor's recommendation at an official and regularly scheduled meeting of the Board (OBOR, 1996).
33. [] After receiving a recommendation of approval, the vice president for instruction shall notify the president and the vice presidents for business and enrollment management--the admissions and registrars office will be notified as well deans and program chairs.

FORMAL PROPOSAL GUIDELINES AND ASSOCIATED FORMS CAN BE FOUND IN OHIO BOARD OF REGENTS OPERATING MANUAL FOR TWO-YEAR CAMPUS PROGRAMS, PAGES 402.03 - 402.11.

Please remove and photocopy. Use as a check sheet.

ADVISORY COMMITTEES

As an initial step toward formal proposal development the Regents recommend the formation of a program advisory committee that will help assure program relevance. The committee is to be "comprised of persons who are not employed by the institution, and who either earn their living doing that for which the program would prepare students, or would most likely be employers of such individuals" (OBOR, p. 402.01, 1996).

The college maintains and requires the formation of advisory committees for all degree programs. In accordance with college procedures, advisory committees meet once per quarter, or more often if a specific need arises. Advisory committees have specific duties at LTC:

- Keeping the faculty and the administration fully informed regarding changes in manpower requirements within the community.
- Assisting with the interpretation of technical education programs to the community.
- Providing another type of forum for discussion of problem areas that concern the specific educational program or technical field.
- Acquiring or maintaining community support for individual programs.
- Periodically reviewing curriculum, teaching methods, evaluation of techniques, etc., in order to bring the faculty's attention to the current (or changing) needs of agencies, industries or businesses.
- Assisting in the planning of new campus facilities or for changes in use of community resources.
- Lending expertise to selection of equipment, when applicable.

According to the instructional division of the college, advisory committees perform very important functions in the development, implementation and evaluation of programs at Lima Technical College. Without such committees it would be more difficult to achieve the true aims and objectives of the college. Advisory committee members, through their expertise and assistance, help the college to establish and maintain rapport with the community and its technological needs. The committees, as their name implies, function in an advisory capacity to college personnel.

The reader should begin the formal proposal process by forming a local advisory committee comprised of persons who are not employed by the college and who are closely related

to or directly employed in the career area most likely to employ graduates of the program. Some or all of the following may be good choices: (a) employers, (b) representatives of trade or professional organizations, (c) business owners, (d) human resource directors from related industries, (e) managers and/or supervisors, (f) industry consultants, (g) secondary educators, etc.

Three different subcommittees are vitally important to the program approval process: (a) curriculum, (b) facilities and equipment, and (c) formal needs and expectations. Their formation should immediately follow establishment of the new advisory committee.

The curriculum subcommittee will work with assigned faculty members and/or the appropriate dean or chairperson to develop: (a) a list of technical competencies that are related to needed workplace skills, (b) the goals and objectives of the potential program, and (c) the curriculum to include course content and sequencing as well as course descriptions. In the case of health technologies, competencies must reflect the realities of licensing, credentialling, and/or accrediting bodies.

The facilities and equipment subcommittee will work to identify potential sources of equipment donations. This subcommittee should attempt to articulate all the equipment needs of the program under development.

The formal needs and expectations subcommittee shall work with college personnel and faculty members to design a process for studying the industry demand for the kind of student expected to graduate from the program. According to the Board of Regents student demand and interest for the program must be assessed and evaluated. This subcommittee can be most helpful in sharing industry mailing lists that, when used, can help ensure adequate sampling of an industry's cross-section. This group may also be helpful in writing and developing the survey instrument and methodologies.

It is very important to maintain complete minutes of all subcommittee activities. These minutes will be submitted with the formal proposal to the Regents.

Members of advisory committees can be very useful during program development. The following list describes ways in which the committee can help the college.

- Proofreading and checking for spelling as well as proofing the vernacular of various documents
- Networking within the profession (introductions and contacts)
- Obtaining favorable prices from venders
- Obtaining industry support for the program
- Identifying the scope and content of the curriculum as well as helping in the sequencing
- Recommending changes to curriculum in order to keep the curriculum relevant to community needs
- Providing valuable mailing lists
- Providing names of text books
- Providing journal names and sources of references
- Providing names and qualifications of potential program leaders and faculty members
- Information on rules and regulations affecting the field or discipline
- Providing names of industry newsletters
- Serving as consultants
- Providing workplace experiences or cooperative agreements
- Equipment and cash support for the program
- Identifying equipment needs for various laboratory or clinical experiences
- Writing letters of support
- Predicting changes in the field which may translate into enrollment declines or increases
- Monitoring and advising on federal, state, and local regulations
- Providing information about credentialling or licensing bodies and their requirements
- Identifying workplace competencies
- Marketing the program to employers and prospective students
- Establishing strategic goals and directions for the program
- Assisting college personnel with yearly action planning

The involvement of advisory committees with program personnel is an important element of new program development. Agendas and minutes must be maintained and submitted to the Regents with the formal proposal. Appendix A provides an example of an advisory committee agenda. Something that may strengthen a formal proposal is a chronology of advisory committee activities and contacts with industry experts, etc., (see Appendix B).

CURRICULUM DEVELOPMENT FOR APPLIED TECHNICAL DEGREES

According to Toombs and Tierney (1995) a college curriculum is an institution's entire educational program. Rudolph (1995) described the curriculum as the institution's "expression of social purpose" (p. 5). In 1907 Louis Franklin Snow, a pioneer historian of curriculum, (as cited in Rudolph) stated that the "ideals of the community have become the ideals of the college . . . "(p. 7). In short, college curricula are social artifacts that reflect societal attitudes and beliefs (Rudolph).

In earlier times--professors "thought of the course of study as serving the needs of an intellectual community as opposed to the needs of individual clients" (Rudolph, p. 8, 1995). But at some time in our history, the client changed from that of society to that of the individual. This change may have started about the time of the civil war.

While a college's curriculum does indeed reflect societal attitudes and beliefs, it takes on a more pragmatic form within institutions offering applied technical degrees. Within the past 20 years American pragmatism has surfaced: students are paying less attention to liberal arts and frequent attention to career oriented programs (Scott, 1995). Students are seeking specialization rather than "a wholeness of mind" (McNeil, p. 84, 1990).

At Lima Technical College, more than 50% of enrolled students are equal to or greater than 25 years of age. The mean age of the student population is just shy of 28 years. According to Knowles and Tough (as cited in Langenbach, 1994) "adults prefer a high dosage of utility in their learning . . . " (p. 17). In short, whatever is learned should have immediate utility for the learner.

Utility in adult education may not be an all-consuming criterion. Both the Regents and LTC are committed to providing the utility as well as course work designed to stir one's imagination, creativity, appreciation of humankind, and enhance one's ability to communicate

effectively. To that end, approximately one-half of all curricula must be devoted to non-technical offerings such as written and oral communication, social/behavioral science, humanities, mathematics, natural science, and computer science (OBOR, p. 5, Appendix A, 1996). Two-year technical programs offer at least 90 hours of quarter credit and may not exceed 110 hours of credit (OBOR, p. 4, Appendix A). According to the Regents at least 42 quarter or 28 semester credit hours of non-technical courses must be offered in a two-year technical program (OBOR, p. 5, Appendix A). These non-technical courses should be designed to maximize transferability to state-assisted four-year colleges and universities.

Technical education curricula prepare students for specialized, occupationally-oriented careers "which are generally (but not exclusively) at the semiprofessional level" (OBOR, p. 100.1, 1996). Although technical colleges offer semiprofessional programs that prepare graduates for immediate employment, some offer professional degree programs in the health technologies (e.g., nursing, respiratory care, dental hygiene, etc.). Professional education is described in the literature as being "narrow, specialized, and focused on skills and training versus general education" (Rhoades, p. 151, 1995). With respect to its function, "professional education is understood primarily in terms of forming and preparing expert and ethical practitioners" (p. 172). When applying this information to the kind of programs offered by two-year technical colleges, it seems reasonable to assume that their programs of study are indeed preparing professionals (as opposed to semiprofessionals) for immediate employment within their specialties. This is further supported by the fact that graduates of many technologies are required to take licensing or credentialling examinations before entering the workplace; often a criterion for a profession.

For purposes of this discussion, curriculum will be treated as a major subsystem of the college and not the whole of what is taught by the college. In the glossary, curriculum is described as a program's mission, purpose, or collective expression of what is important for

students to learn. It includes experiences to be learned by students as well as a time-credit framework in which the college provides the educational program (Stark & Lowther, as cited in Toombs & Tierney, 1995). Steenholdt (1994) described a curriculum as "an agreement which is designed to allow the student and employer to select and evaluate" (p. 69) its appropriateness, and later its effectiveness.

The curricular descriptions put forth by Stark and Lowther (as cited in Toombs & Tierney, 1995) and by Steenholdt (1994) are captured in Tyler's rationale for creating curriculum. Ralph Tyler put forth a traditionalist's view of curriculum development that proposes four basic questions (Hunkins & Hammill, 1995):

- What educational purposes should be attained?
- What educational experiences can be provided that will attain these purposes?
- How can these experiences be effectively organized?
- How can one tell if the purposes have been achieved?

Tyler's rationale is comfortable to faculty members because it has the identifiable components of objectives, subject matter, methods, and materials. Tyler's thinking remains a popular influence in colleges and universities throughout the country (Hunkins & Hammill, 1995).

Giving more detail to Tyler's rationale is another traditionalist, Hilda Taba. "Like Tyler, she noted that all curricula are composed of certain elements" (Taba, as cited in Hunkins & Hammill, p. 19, 1995). Taba proposed a seven-step model for creating curriculum by faculty members or curriculum designers:

- Identify the needs of the students.
- Select objectives, which gives an observable outcome to the learning.
- Select the subject matter of the curriculum.
- Organize content so as to attain expected results.
- Organize learning experiences into an optimal sequence.
- Evaluate the completion of objectives.

Both Tyler and Taba were traditionalists who believed in excluding others from participating in curriculum design. In their view, faculty members create everything for the

curriculum from its goals to its learning experiences: the curriculum is designed based on the expertise of the faculty.

Today's practicality suggests a different approach to curriculum development, especially in two-year colleges preparing students for technical or professional/semiprofessional careers. Curriculum development seems more appropriate as a social activity involving faculty, students, employers, and other interested parties from the wider community of interest (Doll, as cited in Hunkins & Hammill, 1995).

According to Toombs and Tierney (1995), effective practicality can be infused into curriculum development by using the three components of design: (a) context, (b) content, and (c) form. Each component can be elaborated to fit higher education. Table 1 is an adaptation of an open matrix shared by Toombs and Tierney. It serves as a checklist that describes potential elements and examples of a practical curriculum design. The curriculum designer may use this matrix as a road map in helping to create the program's curriculum. The complete matrix can be found on pages 335-336 of Revisioning Curriculum In Higher Education, edited by Jenifer Haworth and Clifton Conrad.

Table 1

Components: A Matrix

1. CONTEXT IN WHICH THE CURRICULUM RESIDES AND IS TO BE DEVELOPED

- Social and Cultural Influences That May Affect Scope, Rigor, and Sequencing of The Curriculum
  - Community expectations, community dimensions, etc.
- Direct Influences Upon the Design of the Curriculum
  - Legislation, public policy, market forces, labor market, financial market, demographic trends, etc. (e.g., student loan programs, placement patterns, sex ratio).
- Organizational Climate
  - Tradition, culture, administrative structure, etc.

2. CONTENT OF THE CURRICULUM

- Knowledge
  - Structure of organized knowledge, methods of verifying the knowledge, principles, theories, laws, etc.
- Learning Psychology
  - Learning strategies for achieving cognitive levels, student capacities for learning, learning styles, student experience, maturity, use of laboratory, clinical, and field experiences.
- Affective Domain: Values, Attitudes, and Beliefs
  - Personality traits, orienting values, attitudes, beliefs, etc.
- Consequences of Knowledge
  - Cognitive outcomes, components of skill and technique, competencies, etc.

3. FORM OF THE CURRICULUM

- Distribution of Learning Resources: Time, Space, Facilities
  - Faculty work loads (e.g., contact hours, preparation time, course development, etc.)
  - Faculty expertise
  - Budgetary system
  - Allocation of physical facilities, space, equipment, services, etc.
- Instructional Strategies and Modes of Instruction
  - Class size and composition, academic calendar, alternatives to formal study, challenge exams, advanced placement, etc.
- Outcomes and Assessment
  - Standardized tests, external examiners, competency reviews, licensing and certification examinations, accrediting boards, evaluations of specific skills.
  - Qualitative assessments, student self-reports, etc.
  - Career development and entry-level experience, formal grading, reporting procedures, alumni surveys, employer feedback, placement data, transcripts, etc.

Clearly there is more to curriculum design than deciding what to teach. The matrix provides a glimpse at some of the factors that may influence the process.

Even after reviewing these three curricular models, the designer may still feel uncomfortable with the development process--especially so at two-year technical colleges. Technical colleges specialize in competency-based or outcome-based education, the design of which requires healthy doses of external inputs. As described by Lagenbach (1994) competency-based curricula are practical, outcome-based, bottom-line, results-oriented curricula. Such curricula teach crucial skills and abilities needed to accomplish discrete tasks associated with specific professional or semiprofessional jobs. The essential purposes of such curricula are well defined end-products or competencies.

What then are the steps to developing a competency-based curriculum? Table 2 provides a list of initial steps in designing of such curricula. In some cases, external accrediting and licensing bodies have content outlines which dictate curricular content, scope, and rigor. These organizations usually have well-articulated definitions of the field as well. Curriculum designers should network with established professionals to determine if such accrediting or licensing bodies exist.

Table 2

Steps To Development of A Competency-Based Curriculum

1. Form local/regional/state advisory committee.
2. State the purpose of the curriculum (e.g., to educate advanced respiratory care practitioners). Remember, form follows function in all cases.
3. With the help of the advisory committee, accomplish a job analysis. In short, try to match what the student learns to what they will do on the job (McNeil, 1990).
4. Brainstorm a list of technical as well as social competencies that are related to needed workplace skills. In the case of health, law enforcement, and some business programs, competencies must reflect the realities of licensing, credentialling, and/or accrediting bodies. See Appendix C for a sample of skills and competencies for asphalt and concrete technology.
5. Use the list of competencies to develop curricular objectives which according to Taba (as cited in Rudolph, 1995) give an observable outcome to the learning.
6. Using the competencies and objectives, brainstorm the course content needed to achieve the stated objectives.
7. Arrange the content into units of study and write descriptions for the new courses. Before creating new courses, check the course inventory to determine applicability of existing courses. It may be feasible to use or amend an existing course to serve two different programs.
8. Arrange the units of study (courses) into an appropriate sequencing that distributes technical courses throughout the length of the program.
9. From established college courses, select appropriate general and basic studies courses that will satisfy non-technical or affective competencies. Non-technical courses should be integrated with technical courses so as to enhance the total experience of the student and their likely success.
10. Do a reality check! Is the curriculum reasonable? Does it have too little or too much rigor? Does it exceed seven quarters of full-time enrollment?

The preceding ten steps should be accomplished in a social setting of collaboration between faculty members and advisory committee members who represent business and industry. Completion of the ten steps should be sufficient to be able to submit a formal proposal for program approval. Further development of the curriculum will come after employing a full-time program director or coordinator. The program director will determine instructional strategies, testing and evaluation techniques, acquire equipment, select textbooks, etc.

A word of caution is appropriate in closing this section on curriculum. In a competency-based curriculum one may not be able to capture the full-scope of what a person does on the job. For example, job activities are often complex and may require a person to demonstrate independent thought and critical thinking. These abilities are difficult to express in terms of competencies (Steenholdt, 1994).

ACCOMPLISHING THE NEEDS ASSESSMENT

As part of the formal proposal development process, the Regents suggest that institutions conduct formal needs surveys which assess potential job opportunities for graduates of new programs. In addition to assessing employment opportunities, the Regents desire an evaluation of student interest in the new program (OBOR, p. 402.01, 1996). In approving technical degree programs, the Board of Regents will consider the manpower needs for the program on a state-wide basis and may recommend several programs for a particular region of the state. Similarly, the Regents may feel compelled to limit programs to specific periods of time (p. 402.02).

Assessing the needs for a particular program is really a joint consulting and decision making process with the direct and indirect customers of the new program. Direct customers are those for whom the program exists, while indirect customers are those who have some stake in what the program does or does not do. For example, the primary direct customer of any education program is the student. Without its students any program ceases to exist. Other groups that may be considered direct customers are persons who will employ the graduates of the new program. Indirect customers could be professional or trade associations which have some stake in how well the program satisfies its mission.

According to Steenhold (1994) and Hedges (1995) the following may be considered direct or indirect customers of a new program:

- Employers.
- Employer organizations.
- Employees.
- Unions.
- Government agencies.
- Professional Associations.
- Current and/or potential students.
- Local commerce chambers.
- Newspapers.
- Cooperative extension services.
- Service clubs.
- Regional planning commissions.

- Regional development boards.
- Better business bureaus.
- State development boards.
- etc.

The customers of the program need to be queried in terms of: (a) short- and long-term employment needs, (b) types of alternative training courses, (c) number of potential students needed to support the program, (d) financial and equipment resources needed by the program, (e) possible joint training arrangements, (f) types of businesses that will employ graduates, (g) types of jobs available, (h) skills needed for the those jobs, and (i) new directions that business and industry may be taking in the future (Steenhold, 1994; Hedges, 1995).

It is recommended that a subcommittee of the advisory group be formed to help in the determination of formal needs and demands. This group shall work with college personnel and faculty members to design a process by which to study the industry demand for the type and kind of student expected to graduate from the program. This group can be most helpful in sharing industry mailing lists that can ensure adequate sampling of the industry's cross-section.

See Appendix D for an example of a needs assessment instrument that was used to assess the industry demand for asphalt and concrete technicians. Note that the survey operationally defines an asphalt and a concrete technician. Such definitions evolve from the curriculum development process and should be accomplished before assessing industry-wide support. In short, the college must be able to define what it proposes to educate if it is to accurately assess the need.

In closing, the establishment of need and demand is really about the allocation of limited public resources. The decision to proceed with program implementation must be based on facts instead of whim or viscera.

COST CONSIDERATIONS FOR NEW PROGRAMS

The following list provides a look at potential costs associated with developing and implementing new two-year associate degree programs. It is certainly not complete but some insight may be gained by reviewing the list.

- Program accreditation.
  - Application fees for program accreditation.
  - Site-visit fees for program accreditation.
  - Accreditation self-study development costs.
- Travel expenses to review and visit other currently operating programs.
- New faculty (salary and expenses).
- Moving expenses for new faculty members.
- Inservice training for new faculty members.
- Costs associated with organizing the advisory committee (supplies, entertainment, travel).
- Mailing costs associated with conducting the needs assessment.
- Photocopying associated with needs assessment and proposal preparation.
- Equipment (new and used).
- Curriculum development.
- Supplies.
- Professional dues.
- Library costs and development (periodicals, journals, etc.).
- Consultant fees.
- Books.
- Heat, light, and phone.
- Secretarial costs.
- Maintenance.
- Rental of equipment and facilities.
- Other indirect costs.

SECTION FOUR

COMPLETING THE PROPOSAL

COMPLETING THE PROPOSAL

Directions for completing both the preliminary and formal proposals for the Ohio Board of Regents can be found in Sections 401 and 402 of the Ohio Board of Regents Operating Manual for Two-Year Campus Programs (revised 1996). The manual is maintained by the office of the vice president for instruction at Lima Technical College.

Preliminary Proposal Submission

The Regents recommend that colleges wishing to begin new degree programs obtain preliminary approval at least six months prior to making formal application. The request should follow the format on pages 401.03 and 401.04 of the two-year manual and should include:

- The reasons for considering the program.
- The number of students expected to enroll.
- The availability of similar programs offered by other institutions.
- Preliminary cost estimates of the new program.

In writing the preliminary proposal, it is helpful to cite the literature that supports your application. Data sources may be discovered by contacting one or two persons from business, industry, health care, or service sectors related to the field of study who can provide names of trade publications, journals, or newsletters. These are often indispensable in building your case for need and demand. Preliminary cost estimates may include any of the items listed in section three as cost considerations for new programs. Remember, the minimum projected first-year enrollments must be at least 15 students and the minimum projected second-year enrollments must be at least 12 students. See Appendix E for an example of a preliminary proposal for program development.

After reviewing the preliminary proposal, the Regent's staff will inform the college of its decision. If approved, the college is free to begin the process of formal proposal development. Preliminary approval will be withdrawn if a formal proposal for the Board has not been submitted within two years of the date of preliminary approval (OBOR, p. 401.01, 1996).

Formal Proposal Submission

In reality, this handbook is about completing the formal proposal for program development; therefore, only a few helpful hints are in order at this time. The reader is invited to review the check sheet in section two and the quick overview in section three of the handbook before preceding with proposal development. The application form for a new program can be found on pages 402.06-402.09 of the two-year campus manual. In addition to these forms, the Regents have outlined their expectations for the proposal on pages 402.03-402.05 of the two-year campus manual (in the past, specific forms were provided for these expectations). The expectations are as follows:

- Nature of the request. Indicate the title of the degree program and the name of the institution submitting the request. Complete and attach the cover page found on page 402.06 of the two-year manual.
- Objectives of the proposed program. Describe the general purpose of the program and list the program's objectives.
- Rationale and need for the program. Explain the rationale for the program; benefits to students, college, and the region; job opportunities; and data supporting the identified need. Discuss any licensure requirements and the role of any consultants and advisory committees during the development of the program and its curriculum. Include documentation of advisory committee involvement (e.g., minutes, anecdotal notes, letters, recommendations, subcommittee activities, etc.). Provide evidence of student demand and full- and part-time student enrollment projections. Include a list of other programs with similar curricula offered at nearby public or private institutions. Explain why the nearby institution cannot serve the needs of Lima Technical College students.
- Academic control. Describe the administrative structure of the program, including the department which will have responsibility for the program. Explain any cooperative arrangements with other institutions to offer the program. Describe any articulation arrangements and attach supporting documentation to the proposal.
- Curriculum. Describe the program as it will appear in the college catalog. List course titles, numbers, credits, catalog descriptions, and classifications as technical, and non-technical. Indicate currently offered courses and the number of new courses as a result of program development. Complete and attach the "Curriculum Outline" which can be found on page 402.08 of the two-year manual (see Appendix F for a facsimile).
- Staffing requirements. Indicate how the proposed program will be staffed.
- Facilities and support services. Describe facilities and support currently in existence at the college which can be used for the new program. Describe additional facilities and modifications that are needed to accommodate the new program. Describe the college's plan for meeting equipment and facility needs that are not presently available.

- Financial resources. Complete the financial impact statement found on page 402.09 of the two-year manual. Describe any internal reallocations that will occur, or other sources of funding to be used to support the new addition.

Helpful Hints for Formal Proposal Submission

At the state level the monies available for new program development are finite. Whether or not new programs are supported depends a great deal on solid evidence of need and on the commitment of each individual institution to supporting the effort. In short, does the submitting institution have adequate evidence of need and what will the institution contribute to bringing the new program online (R. Smith, personal communication, May 29, 1996)? A second point of consideration may be whether the submitting institution is willing to disengage a current program receiving subsidy support in favor of the new program. In the future, the whole process may take on the appearance of a challenge grant.

Here are some helpful hints, in addition to the remainder of the handbook, which may improve or enhance your proposal for program approval:

- Develop and include a marketing plan for the new program.
- During the investigation of other nearby programs of similar nature inquire about the following:
  - Length of operation.
  - Is recruitment of students difficult?
  - What is the job placement rate?
  - After five years are graduates still working in their field of study?
  - What happens to enrollment after the newness wears away?
  - Is there a national or state accrediting body?
  - Compared to other programs, is the program costly to operate?
  - Have faculty members been difficult to recruit?
- Have advisory committee members sign letters of commitment to assisting with program development.
- Investigate the literature and cite references in the proposal.
- Show in-kind support for the new program.
- Show industry and business support for the program via equipment or in-kind donations to the new program.
- Seek out two-plus-two arrangements that demonstrate transferability for graduates.
- Include a list of needed equipment and a plan for obtaining the equipment through business and industry supporters.

SECTION FIVE

GLOSSARY

GLOSSARY

Curriculum. A program's mission, purpose, or collective expression of what is important for students to learn. Includes experiences to be learned by students as well as a time-credit framework in which the college provides the educational program (Stark & Lowther, as cited in Toombs & Tierney, 1995). Steenholdt (1994) described a curriculum as "an agreement which is designed to allow the student and employer to select and evaluate" (p. 69) its appropriateness, and later its effectiveness.

Course. According to Toombs and Tierney (1995, p. 338) a course is the "basic building block" and fundamental unit or module of a curriculum.

Program. "A collection of courses that lead to certification or credentials" (Toombs & Tierney, p. 341, 1995). Persons who complete educational programs possess and demonstrate particular levels of knowledge and skill.

A New Degree Program. According to the Regents, a "new degree" program is any prescribed program of study in a state-assisted institution of higher education which constitutes an area of concentration or specialization leading to a designated degree (OBOR, 1996).

Length of Program. Associate degree programs must contain at least 90 quarter or 60 semester hours of credit and should not exceed 110 quarter of 73 semester hours of credit. If licensing requirements and procedures require additional hours, exceptions may be granted. Academic quarters should be eleven weeks duration with ten weeks devoted to instruction. Academic semesters should be 16 weeks duration with 15 weeks devoted to instruction. Associate degree programs should not exceed seven quarters (four semesters) of full-time study (OBOR, p. 4, Appendix A, 1996).

Competencies. Crucial skills and abilities needed to accomplish discrete tasks associated with specific professional or semiprofessional jobs. The term proficiencies may be substituted for competencies. In sum, competencies identify what a person actually does to do their job (Steenholdt, 1994).

Competency Based Curriculum. A product of the last 20 years. A practical outcome-based, bottom-line, results-oriented curriculum (Langenbach, 1994). Often part of programs that lead to external certification or licensing (Toombs & Tierney, 1995).

Training. According to Lagenbach (1994) education and training may be differentiated on the basis of purpose. If the purpose of the activity has a "well-defined end product or competence" (p. 12) then the activity may be considered training. On the other hand, when the end product is not known with a great deal of precision and if the end product involves continual learning and development then the activity may be considered education. Education rarely has the specific and predictable hallmarks of training.

Scope and sequence. The content of a program of study and the arrangement of content into units of study.

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Profession. An occupation characterized by certain objective traits such as "a code of ethics, a technical knowledge base, control over certification and entry into an occupation" (Rhoades, p. 152, 1995).

Baccalaureate Parallel Education. Equivalent to the lower division or first two years of a baccalaureate degree program. Consists mostly of liberal arts, sciences, and pre-professional studies that enable students to transfer to a four-year institution for completion of a baccalaureate degree (OBOR, 1996).

Technical Education. Programs of two-years' duration designed to prepare students for careers "which are generally (but not exclusively) at the semiprofessional level" (OBOR, p. 100.1, 1996). Technical programs may provide upgrading of workplace skills and are often transferable to four-year degree programs.

Technical Education Degree Programs. In the state of Ohio, "degree programs offered as technical education includes two-year curricula in Engineering and Industrial Technologies, Business Technologies, Agricultural and Natural Resource Technologies, Health Technologies, and Public Service Technologies" (OBOR, p. 2, Appendix A, 1996).

Classroom Hour. A classroom hour is fifty-minutes of formal classroom instruction, conducted, on- or off-campus, in which the instructor presents educational experiences in the form of lectures, demonstrations, directed discussions, or audio-visual selections. The instructor must be primarily responsible for conducting the class and must interact with students during the class period. Out-of-class assignments are an expectation and should be designed to provide two hours of out-of-class activity for each formal hour of class. Out-of-class study may not be counted as part of the classroom hour. **One credit, either quarter or semester, shall be awarded for each classroom hour which is scheduled during a typical week of the quarter or semester. For example, if a class meets for three, fifty-minute hours during a typical week then three hours of credit are awarded. In the case of a 10-week quarter, a three quarter hour course would meet for 30, fifty-minute hours (OBOR, 1996).**

Laboratory Hour. A laboratory hour is fifty-minutes of instructional activity in which students conduct experiments, perfect psychomotor skills, practice procedures, or otherwise simulate patient care activities under the watchful eye of an instructor. Out-of-class activities may be assigned but are not an expectation. **One credit, either quarter or semester, shall be awarded for a minimum of three laboratory hours which are scheduled during a typical week of the quarter or semester when little if any out-of-class activities are assigned. If at least an hour of out-of-class activity, such as preparation and/or follow-up are assigned, then one credit is to be awarded for every two hours spent in lab during a typical week. In the case of a 10-week quarter, a one quarter hour laboratory course would meet for 30, fifty-minute hours (OBOR, 1996).**

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Clinical Laboratory Hour. Clinical laboratory hours apply only to health technology programs. These experiences provide a realistic environment for student learning and are generally held off-campus in clinical health facilities (the one exception dental hygiene technology). Instructors are assigned in the same manner as an on-campus laboratory hours and maybe either full- or part-time faculty members. Credit hours are awarded in the same manner and ratio as described under laboratory hours (OBOR, 1996).

Directed Practice Hour. Directed practice hours apply only to health technology programs. During directed practice hours students receive individual instruction from full- or part-time instructors as well as adjunct instructors who may or may not be paid by the college. Directed practice hours are 60 minute periods in which health students practice their clinical specialties under the careful scrutiny of instructors. The faculty member coordinating the directed practice must conduct at least one, 50 minute lecture session each week for participating students, provide the grade for each student, and visit the students at least once a week during the term. **One credit (quarter or semester) will be awarded for a minimum of five clock hours of directed practice. In the case of a 10-week quarter, a one credit hour directed practice course would meet for 50 clock hours (OBOR, 1996).**

Practicum Hour. A practicum hour is an on- or off-campus, unpaid, 60 minute, work experience that is integrated with academic instruction. The practicum is under the direction of a faculty member who must visit the student once each two weeks. This is a graded experience by a faculty member who teaches at least one course on the campus each academic term. A practicum requires on-campus seminars that must be offered in conjunction with the off-campus experience. A maximum of 13 quarter or 9 semester hours may be earned over the associate degree program (see cooperative work experience for more information). **One credit (quarter or semester) shall be awarded for a minimum of seven clock hours per week in the practicum. The credit hour to contact ratio must be at least 1:7 or greater (e.g., 1:8 or 1:9). In the case of a 10-week quarter, a one credit hour practicum would meet at least 70 clock hours (OBOR, 1996).**

Cooperative Work Experience. A cooperative work experience (Co-op) augments formal instruction in certain technical programs. It is usually a paid work experience that meets on- or off-campus. The co-op is coordinated by a faculty member of the college who is required to visit the job site to confer with the student and their assigned supervisor at least once each academic term. In consultation with the student's supervisor the faculty assigns a grade for the co-op work experience. Co-op experiences require an on-campus seminar that is offered concurrently to the co-op. A maximum of 13 quarter or 9 semester hours of co-op may be earned during the associate degree program; however, if a practicum is to be included as part of the curriculum, the sum of the two types of experiences may not exceed 13 quarter of 9 semester hours of credit. **One credit (quarter or semester) shall be awarded for a minimum of ten clock hours per week in the practicum. In the case of a 10-week quarter, a one credit hour co-op would require at least 100 clock hours of assigned work experience (OBOR, 1996).**

Field Experience. A field experience is a planned, paid work experience that directly relates to the students career objectives. It may be taken in lieu of electives or required courses with the permission of a faculty advisor. A faculty member coordinates the activity and assists the student with planning the experience as well as visits the job site to consult with the student and their

supervisor. Grades are awarded in consultation with a student's supervisor. On-campus seminars are not a required component of field experiences. A maximum of 13 quarter or 9 semester hours of field experience may be earned during the associate degree program; however, if field experiences are included as part of the curriculum, the sum of the three types of experiences (practicum, co-op, and field experiences) may not exceed 13 quarter of 9 semester hours of credit during the associate degree. **One credit (quarter or semester) shall be awarded for a minimum of 12 clock hours per week in the practicum. In the case of a 10-week quarter, a one credit hour co-op would require at least 120 clock hours of assigned field experience (OBOR, 1996).**

Observation Hour. An observation hour is an experience where students participate as observers of practitioners representative of their occupational area of concentration. Faculty members coordinate observation hours and receive reports from students regarding their experiences. **One credit (quarter or semester) shall be awarded for minimum of 15 clock hours of observational experience per week. In the case of a 10-week quarter, a one credit hour observational experience would require at least 150 clock hours of observation (OBOR, 1996).**

Seminar. A seminar is a less formal educational experience than a classroom hour as previously discussed. Seminars are lead by faculty members who strive to develop or review concepts which have been applied to practical situations. **One credit (quarter or semester), shall be awarded for each seminar hour which is scheduled during a typical week of the quarter or semester. For example, if a seminar meets for three, fifty-minute hours during a typical week then three hours of credit are awarded. In the case of a 10-week quarter, a three quarter hour seminar course would meet for 30, fifty-minute hours (OBOR, 1996).**

Miscellaneous Applications Courses. These courses provide extended periods of independent study or practice subsequent to individualized instruction. Instructors assign the skills activities or objectives for the student. The instructor evaluates student progress and assigns a grade based on progress toward achieving the learning goals. **One credit (quarter or semester) shall be awarded for a minimum of seven clock hours of activity per week. In the case of a 10-week quarter, a one hour independent study would require 70 hours of extensive practice or study (OBOR, 1996).**

Community College. Defined by Ohio Revised Code 3354 as a two-year college established to offer baccalaureate transfer programs as well as technical education programs, adult continuing education, developmental education, workforce skills enhancement, and community service activities. Community colleges are empowered, and encouraged, to secure local property tax levies. These levies are focused at keeping student fees lower than other types of two-year colleges (OBOR, p. 201.1, 1996). Community colleges may award the associate of arts and science degrees as well as the associate of applied science and business degrees. In addition, community colleges may also award the associate of technical and individualized studies.

State Community College. Defined by Ohio Revised Code 3358 as a two-year college established to offer baccalaureate transfer programs as well as technical education programs, adult continuing education, developmental education, workforce skills enhancement, and community service activities. Unlike community colleges, state community colleges may not levy local property taxes

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(OBOR, p. 201.1, 1996). State community colleges may award the associate of arts and science degrees as well as the associate of applied science and business degrees. In addition, community colleges may also award the associate of technical and individualized studies.

Technical College. Defined by Ohio Revised Code 3357 as a two-year college established with a technical college district. Once established the technical college district becomes an independent political subdivision. Technical colleges offer specialized "technical education programs, occupationally-oriented adult continuing education programs, community service activities, workforce skills enhancement, and developmental education (OBOR, p. 201.1, 1996). Technical colleges may offer the associate of applied science and applied business degrees as well as the associate of technical and individualized studies degrees. These degrees are often transferable to four-year colleges for completion of baccalaureate degrees. Technical colleges participate in the state approved transfer module.

Associate of Arts. Designed for a student whose educational objective is a baccalaureate degree with an emphasis in the Arts, Social Sciences, or Humanities. Generally equivalent to the first two years of a baccalaureate degree program. It "signifies the halfway point in the progression toward a baccalaureate degree" (p. 1, Appendix A). The minimum number of hours for completion of the degree is 90 quarter (or 60 semester) credit hours. At least 54 quarter or 36 semester credit hours must be taken in the Arts and Humanities, English Composition and Literature, Social and Behavior Sciences, and the Natural Sciences as well as Mathematics. "The balance of course credits required for the Associate of Arts degree shall not be used by institutions to deliver programs in technical education" (OBOR, p. 301.1, 1996).

Associate of Science Degree. Designed for a student whose educational objective is a baccalaureate degree with an emphasis in general education as well as the Natural Sciences and Mathematics. Generally equivalent to the first two years of a baccalaureate degree program. It "signifies the halfway point in the progression toward a baccalaureate degree" (p. 1, Appendix A). The minimum number of hours for completion of the degree is 90 quarter (or 60 semester) credit hours. At least 54 quarter or 36 semester credit hours must be taken in the Arts and Humanities, English Composition and Literature, Social and Behavior Sciences, and the Natural Sciences as well as Mathematics. "The balance of course credits required for the Associate of Science degree shall not be used by institutions to deliver programs in technical education" (OBOR, p. 301.1, 1996). Programs may not exceed 110 quarter or 73 semester credit hours (see Appendix A, Rule 3333-1-04), Ohio Board of Regents Operating Manual for Two-Year Campus Programs.

Associate of Technical Study. Designed for a student whose educational objective cannot be met by existing academic programs on a particular campus. A minimum of 90 quarter or 60 semester credit hours of individually planned study is required for this degree. The program of study must have an area of concentration that is equivalent to 45 quarter or 30 semester credit hours. Extensive individual advising is needed in order to plan a coherent combination of technical courses from two or more programs which will meet the degree requirements (OBOR, 1996).

GLOSSARY

Associate of Individualized Study. Designed for a student who wants to combine courses from at least two and no more than four instructional areas. Courses may be intra-institutional or interdisciplinary. A minimum of 90 quarter or 60 semester credit hours of individually planned study is required for this degree. The program of study must have an area of concentration that is equivalent to 30 quarter or 20 semester credit hours.

Associate of Applied Science and Business Degrees. Designed for students in specialized degree programs with the goal of preparing persons for specific occupations. Approximately one-half of the curriculum leading to the associate of applied science or business degree should be devoted to non-technical offerings such as basic and general education courses. The basic and general education portions of the curriculum should be transferable to four-year institutions. The minimum number of hours for completion of the degree is 90 quarter or 60 semester credit hours. Programs may not exceed 110 quarter or 73 semester credit hours (see Appendix A, Rule 3333-1-04), Ohio Board of Regents Operating Manual for Two-Year Campus Programs (OBOR, 1996). Technical associate degree programs may be approved for a designated period of time.

Technical Majors. An area of specialized study under an approved degree program title (associate of applied science or business) that consists of 18 to 24 quarter (or 12 to 16 semester) credit hours. It is recommended by the Regents that no more than four majors be offered under any one degree program. Appendix E of the Two-Year Campus Manual lists titles that may be used to describe majors (OBOR, 1996).

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SECTION SIX

APPENDICES

Agenda
Asphalt and Concrete Technology
June 19, 1995
10:00 a.m. to 12:00 p.m., Lima Technical College
Board Room (214), Public Services

I. Introductions and Welcome
II. Old Business
  1. Regents preliminary approval
  2. Productivity Improvement Challenge Grant Application
    a. Timeline
  3. Roster of committee
III. New Business
  1. Study to determine formal need
    a. Mailing lists (who do we survey?)
    b. Survey (method)
    c. Types/kinds of questions (how many)
    d. Adequate cross section of the industry
      1d. Employers (who are they)
    e. To whom to address the survey
    f. Survey deadlines
  2. Curriculum content
    a. Types of courses (lectures, labs, and field experiences)
      1a. Co-operative work experiences (school-to-work)
    b. Topics and subjects to be taught
    c. Academic calendar (are there better times of the year to teach certain subjects?)
    d. Number of hours in the curriculum
    e. Books and instructional materials
    f. Standardized tests and matrices
  3. Reference and resource materials
    a. Creating a listing of associations and organizations
    b. Publications/newsletters/journals
    c. Mailing lists (how do we get on)
    d. Membership in organizations
  4. Facilities/Equipment
    a. What types and kinds of labs are needed?
      1a. Size and requirements
      2a. Safety concerns
    b. What types and kinds of equipment and supplies are needed?
    c. Equipment donations (is there available equipment that may be donated?)
  5. Instructor Qualifications
    a. What type of instructor/s should be employed?
      1a. Qualifications/credentials
    b. From where can we recruit instructors?
    c. Potential salary requirements
  6. Funding
    a. Scholarships
    b. Funding donations
  7. Election of chairperson

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The following is a chronology of events which depict the activities and support of advisory committee members since January 1995.

- (March 28, 1995). Meeting with Mr. Fred Frecker, Professional Engineer, President/Executive Director of Flexible Pavements, Inc., Columbus, Ohio. Mr. Frecker provided two-hours of personal consultation regarding the elements needed to begin an asphalt technician program in Ohio. Mr. Frecker, subsequently made himself available on numerous occasions via the telephone to answer questions and to respond to requests for advice. Mr. Frecker subsequently became a member of the program's advisory committee as well as the curriculum subcommittee and the subcommittee that developed the needs survey. Many of his written opinions are included in the supporting documentation attached to this proposal. Mr. Frecker was instrumental in developing the preliminary program proposal that was submitted to the Ohio Board of Regents in April 1995.

- (May 9, 1995). Phone consultation with Mr. Roger Jones, President, Ohio Ready Mixed Concrete Association, Columbus, Ohio. Mr. Jones provided one hour of telephone consultation regarding the elements needed to begin a concrete technician program in Ohio. Mr. Jones subsequently became a member of the program's advisory committee as well as its curriculum subcommittee and the subcommittee that developed the needs survey. Mr. Jones was also chosen as the advisory committee's first chairperson.

- (June 14, 1995). With the help of Mr. Frecker and Mr. Jones as well as Ohio University, Athens, Ohio; Mr. Clayton Bacon, Allen County Engineer; Mr. Lyle Peplinski, Branch Manager of Professional Service Industries, Inc.; and The University of Dayton a Productivity Improvement Challenge Grant Application was submitted to the Ohio Board of Regents in June 1995 (see Attachment 4). The grant requested seed monies but was unfortunately not supported in the competition. A second grant application submitted by the college was supported for funding along with ten other grant applications in the state of Ohio.

- (June 19, 1995). The first advisory committee meeting was held at Lima Technical College in Lima, Ohio, (see Attachment 5). At the first meeting Mr. Lyle Peplinski was chosen as vice chair and a curriculum subcommittee was appointed consisting of Mr. Frecker; Mr. Jones; Mr. Bruce Merry, District Construction Administrator of District One of the Ohio Department of Transportation; and Mr. Lyle Snyder, Branch Manager of Northwood Construction, Lima, Ohio. The curriculum subcommittee also served to develop the needs survey which was later mailed in September 1995.

- (August 17, 1995). The first curriculum subcommittee meeting was held at the college in Lima, on August 17, 1995. At the first meeting a draft of a needs survey was developed, definitions of concrete and asphalt technicians were drafted, and a potential curriculum that provided a mix of courses in Arts and Sciences, Related Basic Studies, and Technical Studies was presented. Brainstorming was conducted

relative to the content of the technical courses and the types and kinds of equipment needed to teach such content.

- (September 6, 1995). The second curriculum subcommittee meeting was held at the college in Lima, on September 6, 1995. At the second meeting course sequencing was decided as well as additional course content and course prerequisites. The final draft of the needs study was approved by the subcommittee at the September meeting (see Attachment 6) as evidence of subcommittee involvement.

- (September 15, 1995). The needs survey was mailed to 280 potential respondents. The mailing list was developed and approved by the curriculum subcommittee.

- (December 15, 1995). The second advisory committee was held at the college in Lima. See attached minutes (see Attachment 7) as proof of committee involvement.

ASPHALT AND CONCRETE TECHNOLOGY

Skills and Compencies

-mix design
-aggregate
-properties
-superpave
-construction practices
-inspection
-lay down practices
-pavement design
-estimating
-tech writing skills
-reading skills
-comprehension
-chemistry (at least exposure)
-math
-blue print reading
-metrics
-molecular structure
-computers
-word processing
-operating systems
-data base
-knowledge of different types of specs and w ???
-technical report (read & understand)
-tech datasheets
-environmental(air, water) quality reports (OSHA, EPA)
-safety practices-compliance rep
-construction practices
    compaction
    asphalt material
    lay down ???
    how important is it when its raining
    ordering proper materials
    placement
    finishing
    ODOT procedure manuals
-quality practices (exposed to methods)
-human skills/leadership qualities
-how to give feed back to producers
-self-confidences/tact
-able to convey information as a developed skill
-managerial skills
-can give idea from his/her head onto a piece of paper

Coordinator:

-true ties (progmatic)
-field experience
-applied
-civil
-structural
-construction management
-project experience
-facilities
-separate areas
-mix design labs (level 1 & 2)
-not really a big amount of space
-some small labs
-depends on class size as to space needed
-ask contractors what it costs to recreate a lab
-go out and visit labs
-superpave has additional expensive equipment

Lima Technical College
Needs Survey
Asphalt and Concrete Technology
September 1995

OPERATIONAL DEFINITIONS:

An Asphalt Technician is a person with training and/or experience to design and test hot mix asphalt. They have knowledge of the property's of aggregates, asphalt cements, and mix additions along with design and testing procedures. Furthermore, technicians are familiar with hot mix asphalt production facilities, construction practices, inspection methods, pavement design, estimating, and safety and environmental regulations. Technicians have skills in blueprint reading, understanding specifications, math and report writing and are qualified to sit for and successfully pass the certification examinations offered by the Ohio Department of Transportation.

A Concrete Technician is a person with training and/or the experience required to sit for and successfully pass the American Concrete Institute's (ACI) Certification tests for Concrete Field Testing Technician-Grade I, Concrete Laboratory Testing Technician-Grades I and II, Concrete Construction Inspector-In-Training, Concrete Transportation Construction Inspector-In-Training, and Concrete Flatwork Technician. Concrete technicians are familiar with quality control and assurance, sales and services, research and development as well as laboratory testing and field work. Furthermore, technicians have knowledge of the property's of aggregates, construction practices, inspection and test methods, pavement design, and estimating. Technicians are skillful in meeting safety, quality, and environmental requirements.

.....

Instructions: Please complete and return the questionnaire to Robert A. Casto at Lima Technical College in the self-addressed, stamped envelope.

Please use the computerized answer sheet to respond to the survey. Use a #2 pencil and completely darken your responses. Return the answer sheet and any comments you may have in the self-addressed stamped envelope.

Name of organization or company [write the name of your organization on the answer sheet]

Name and title of person completing the survey [write the name and title on the answer sheet]

USE ANSWER SHEET FOR REMAINING QUESTIONS:

REMEMBER: USE A #2 PENCIL

Sample:

In what state are you located?
a. Ohio
b. Indiana
c. Michigan
d. Other

B C D E

1. Type of organization?
a. Private for profit
b. Government
c. Trade association
d. Professional association
e. Other

2. Primary nature of business:
a. Asphalt Paving
b. Concrete Production
c. Testing Laboratory
d. Other

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3. In what state are you located?
a. Ohio
b. Indiana
c. Michigan
d. Other

4. In what region of the state is most of your work concentrated (mark only one)?
a. Central
b. Northwest
c. Southwest
d. Northeast
e. Southeast

5. How many persons, including supervisors and technicians, do you employ who work with asphalt paving or concrete production?
a. 1-10
b. 11-20
c. 21-30
d. 31-40
e. More than 40

6. Do you employ ODOT Certified Level I Asphalt Technicians
a. yes
b. no

7. How many are employed?
a. 0
b. 1-2
c. 3-4
d. 4-5
e. 6 or more

8. Do you employ ODOT Certified Level II Asphalt Technicians
a. yes
b. no

9. How many are employed?
a. 0
b. 1-2
c. 3-4
d. 4-5
e. 6 or more

10. Do you employ ACI Certified Field Testing Concrete Technicians
a. yes
b. no

11. How many are employed?
a. 0
b. 1-2
c. 3-4
d. 4-5
e. 6 or more

12. Do you employ ACI Certified Flatwork Finisher Technicians?
a. yes
b. no

13. How many are employed?
a. 0
b. 1-2
c. 3-4
d. 4-5
e. 6 or more

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14. If you employ certified asphalt technicians; from where do they get their training?
a. On the job training
b. Formal schooling (college or university)
c. Home study via books and audiovisuals
d. Training courses such as those offered by trade associations
e. Training courses such as those offered by State Agencies

15. If you employ certified concrete technicians; from where do they get their training?
a. On the job training
b. Formal schooling (college or university)
c. Home study via books and audiovisuals
d. Training courses such as those offered by trade associations
e. Training courses such as those offered by State Agencies

.....

Producers, contractors, and testing facilities answer questions 16-38.

PROFESSIONAL/TRADE ASSOCIATIONS AND STATE AGENCIES SKIP TO QUESTIONS 33.

Use the following code to answer questions 16-32.

For example, if you strongly agree with the statement, mark "a" on your answer sheet.

a. Strongly Agree
b. Agree
c. Somewhat Agree
d. Disagree
e. Strongly Disagree

16. My company promotes from within and hires few outside technicians.
17. In the future, my company would prefer hiring associate degree trained technicians.
18. In the past, my company has had difficulty finding enough qualified asphalt or concrete technicians to satisfy employment needs.
19. My company is willing to pay higher entry level salaries to trained technicians.
20. My company is willing to work cooperatively with Lima Tech in providing field experiences to students from the college.
21. My company would be willing to arrange workers' schedules so that employees could attend classes at Lima Tech.
22. My company employees others who could also benefit from classes in asphalt and concrete technology.
23. Televised courses would be a way to provide lecture material to employees who desire to take asphalt and concrete classes.
24. My company is willing to use courses provided by Lima Technical College to train current employees.

.....

All parties complete questions 25-38.

25. Evening is the best time to offer courses in asphalt and concrete technology.
26. Mornings and afternoons are the best times to offer courses in asphalt and concrete technology.
27. 30 technician graduates per year would be able to get work in Ohio.
28. 30 technician graduates per year would be able to get work in Ohio, Indiana, and Michigan.
29. A two-year associate degree program in Asphalt and Concrete Technology is a good idea.
30. Lima is a good location to provide education in asphalt and concrete technology.
31. Trained persons cause entry level salaries to increase.
32. January, February, and March are slow business months and would be the best times to offer classes.

33. Expected technologic advancements and new innovations may increase your need for trained technicians: Please estimate how many asphalt and concrete technicians will be employed by your company in the year 2000.
a. 1-2
b. 3-4
c. 5-6
d. 7-8
e. Greater than 8

34. Does your company reimburse employees for travel and expenses associated with continuing education or workforce training?
a. yes
b. no

TURN OVER TO ANSWER LAST PAGE

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35. Does your company provide tuition reimbursement for courses taken at a college?
a. yes
b. no

36. In your estimate, how far would your employees be willing to travel to participate in an asphalt and concrete technician program?
a. less than 20 miles
b. 20-30 miles
c. 31-40 miles
d. 41-50 miles
e. greater than 50 miles

37. What is your company's average range of pay for asphalt technicians?
a. $6.00 - $7.50 per hour
b. $7.51 - $9.00 per hour
c. $9.01 - $10.50 per hour
d. $10.51 - $12.00 per hour
e. Greater than $12.01 per hour

38. What is your company's average range of pay for concrete technicians?
a. $6.00 - $7.50 per hour
b. $7.51 - $9.00 per hour
c. $9.01 - $10.50 per hour
d. $10.51 - $12.00 per hour
e. Greater than $12.01 per hour

COMMENTS: [cut on dotted line and return comments with answer sheet]

.....

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Ohio Board of Regents Operating Manual for Two-Year Campus Programs	Format/ Preliminary Approval
4/1/89	Page 405.1

OHIO BOARD OF REGENTS
Request for Preliminary Approval

Lima Technical College (Name of Campus) requests preliminary approval of the Administrator for Two-Year Campuses of the Ohio Board of Regents to:

[X] Develop proposal for a new two-year ASSOCIATE DEGREE program.

Title of Program: Asphalt and Concrete Technology

[ ] Offer a MAJOR under an associate degree program already approved for this campus.

Title of Program: _____

Title of Major: _____

[ ] Offer a one-year program.

Title of Program: _____

Cooperating Campus: _____

Sam D. Bassett, VP Instruction
Signature of Campus Official Making Request

4-11-95
Date of Request

Return to: Director, Two-Year Campus Programs
Ohio Board of Regents
30 East Broad Street, 36th Floor
Columbus, Ohio 43266-0417

Date Distributed to Two-Year Campus Leadership: _____

OBR STAFF ACTION:
[X] Approved
[ ] Denied
[ ] Held for further consideration
[ ] Comments/Conditions _____

Reuma E. Smith
Director, Two-Year Campus Degree Programs

May 1, 1995
Date

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I. Why is this proposed addition to the curriculum necessary?

Concrete and Asphalt Technology

The need for a quality transportation system in Ohio is vital to the economic welfare of the state. The backbone of Ohio's transportation system is its nearly 19,000 miles of paved highways and bridges. According to the Ohio Construction Information Association, construction and maintenance of Ohio's highways is a $1.5 billion a year business. Most of the interstate highways were built during the 1960s. As a result of their age, the interstate system must be fully rebuilt. In Ohio, one-third of our major highways and 41.5% of our secondary roads are rated as substandard. Ohio's growth and robust economy have placed burdens on its highway system. Vehicle miles traveled climbed from 72 billion in 1980 to 96.7 billion miles per year in 1995. It is estimated that vehicle miles traveled per year will approach 110 billion by the year 2000. Based on these factors, the Ohio Department of Transportation presently is planning 209 projects costing $5.4 billion dollars to be accomplished during the next 50 years. The rapidity of project completion depends on available funding. These projects will inevitably create more jobs. According to the Ohio Construction Information Association, each $100 million of highway improvements create 2,393 jobs.

In Allen County, home to Lima Technical College, there are approximately 1,256 miles of paved highways. This includes the aggregate total of state, city, township, and city/village roads, streets, and bridges. The highway system of Allen County is no less important to the county's economic well being than the highway system is to the state. As a result, 57,228 tons of hot mix asphalt were applied to the surfaces of Allen County roads in 1994. The total spent on resurfacing, repair, and construction of Allen County roads in 1994 was $1.7 million. This represents a 23% increase over monies spent in 1993 for road repair and construction. These figures do not include what was spent by the state for road resurfacing and construction in Allen County.

In addition to road resurfacing and construction--is the repair, inspection, and construction of more than 425 bridges in Allen County. Each year, inspectors (technicians) from the Allen County Engineer's Office personally inspect 390 bridges to determine the structural integrity of each bridge. The county assists surrounding cities and townships with the inspections of the remaining 35 bridges. Within Allen County alone, there are 32 bridges with posted weight limits. Each year the county replaces 10-12 bridges with new structures. County technicians are also responsible for the care, maintenance and inspection of roadways and storm drainage systems, petitioned ditch projects, and new subdivision construction.

The hub of economic activity in west-central Ohio is the city of Lima. In 1994 the city spent $1.5 million for street reconstruction and resurfacing. 1995 will see that figure increase to $2 million. The city is also responsible for the care the maintenance of the asphalt and concrete of its many bridges.

According to the National Center for Asphalt Technology, 96% of all paved roads and streets in the United States, almost 2 million miles, are surfaced with hot mix asphalt. The technology, by which hot mix asphalt is designed, mixed, and applied to surfaces, is rapidly changing. "In the past, asphalt specifications addressed the composition of the materials used in building a road, rather than the performance of the road" (Strategic Highway Research Program [SHRP], National Research Council, 1992, p. 3). All that is changing as new specifications based on performance and durability emerges. SHRP continues to refine and improve its asphalt binder specifications with

the result being a superior asphalt that addresses the elements leading to deterioration such as loss of adhesion, rutting, and/or low temperature cracking. In order to apply SHRP technology using its Superpave specifications, special equipment must be purchased. In addition, the industry is rapidly changing to metric specifications which should help simplify needed measurements during the application, design, and mixture processes.

The undercarriages of bridges are constructed of steel or steel reinforced concrete. Hot mix asphalt is usually the choice for a bridge's road surface. During the planning and construction of bridges a variety of concrete and asphalt mix designs may be used. Achieving the correct density, compression strength, and compaction of base course materials is vitally important to the longevity and structural integrity of each bridge and roadway.

As technology changes and the methods of highway, bridge, and ditch construction evolves, the need for technicians capable of performing laboratory tests on materials proposed for construction of flexible pavements and bridges will increase. In order to accomplish such testing, technicians will need knowledge of geometry and trigonometry as well as formal education in English. Technicians will typically, test materials for: a) physical properties of elastomeric products and/or expansion filler; b) absorption and specific gravity of coarse and fine aggregates; c) weights and weathering resistance of aggregates; and d) perform compaction tests on embankments and subgrades. In addition, technicians must be able to calibrate and maintain test equipment, and be capable of maintaining records and operating computers. Field placement technicians and inspectors will also be needed to perform nuclear density testing and classification of different soil types as well as tests to determine the nuclear densities of concrete and asphalt.

The Ohio Department of Transportation (ODOT) recognizes two levels of technicians. Level one qualified technicians must pass an examination administered by ODOT. Level two qualified technicians also are required to pass an examination given by ODOT. When contractors submit material mixtures for ODOT approval,the submissions must be prepared by qualified level two technicians. As a result, most highway construction firms (between 60-70 in Ohio) employ both levels of qualified technicians. Each of the 12 ODOT District Offices also employs levels one and two technicians.

City and county engineering departments employ field placement technicians as well as laboratory technicians. There are a number of private testing firms that provide analysis and site certification services to city and county governments as well as private contractors. Each of these testing firms employs field placement and lab technicians.

The mid 1990s ushers in a period of retirement for many of the engineers and technicians who entered the work force during the early days of the construction of the interstate highway system. These people must be replaced with engineers and technicians who are knowledgeable of asphalt and concrete materials and their proper use. In order to satisfy statewide employment needs for qualified technicians and inspectors--preliminary program approval is being requested.

References

National Research Council. Strategic Highway Research Program. Annual Report (1992).

The Ohio Construction Information Association. Your Ohio highway investment. 1995.

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II. *Is this program/major currently offered by any postsecondary institution (public, private, or proprietary) within a thirty mile radius of the requesting campus?*

A. YES [ ] NO [X]
B. *If yes, name of institution:* _____
C. *If yes, why should an additional program in the area be initiated?*

III. *Preliminary estimate of additional costs which would be incurred by the addition of this proggram/major, taking into account the costs of new faculty, equipment, remodeling, and other instructional and indirect costs:*

	Year One	Year Two	Year Three
Faculty	$50,000	$75,000	$80,000
Equipment	75,000	75,000	30,000
Lease or Remodeling	20,000	20,000	20,000
Other Institution	15,000	25,000	25,000
Indirect Costs	15,000	15,000	15,000
	$175,000	$210,000	$170,000

IV. *Preliminary estimate of headcount enrollments:*

	1996- 1997	1997- 1998
First Year Students	15	25
Second Year Students	0	12
Total	15	37

E. Provide a summary and classification of the courses comprising the program by quarter, assuming full-time enrollment. Provide subtotals of credit hours by quarter, by course type, and by total credit hours required.

SUMMARY AND CLASSIFICATION OF COURSES

LIMA TECHNICAL COLLEGE
Institution

ASPHALT & CONCRETE TECHNOLOGY
Associate Degree Program

12-22-95
Date

Course No.	Course Title	Clock Hours: Class	Clock Hours: Lab	Credit Hours: Basic	Credit Hours: Non-Tech	Credit Hours: Tech
First						
MTH 121	Mathematics I	5	1	5		
COM 111	English Composition	5			5	
PSY 122	Industrial Psychology	5			5	
BET 122	Chemistry for Engineering Techs	4	2	4		
		19	3	9	10	-
Second						
MTH 122	Mathematics II	5	1	5		
COM 114	Engineering Technical Writing	3	1		3	
BET 123	Organic & Polymer Chemistry	4	2	4		
ACT 112	Orientation & Seminar	1				1
ACT 122	Aggregate Materials & Soil Systems	3	3			4
		17	7	9	3	5
Third						
ACT 133 or ACT 143	Asphalt Materials and Additives or Concrete Materials and Additives	3	2			4
MTH 126	Statistics	5		5		
BET 113	Physics II	4	2	4		
IET 110	Manufacturing Management	3			3	
		15	4	9	3	4
Fourth						
ACT 231 or ACT 241	Mix Design of Asphalt or Mix Design and Control of Concrete	2	2			3
ACT 221	Design of Rigid and Flexible Pavements	3				3
CPT 125	Computer Applications in the Workplace	5				5
MED 101	Blueprint Reading & Sketching	3	3			4
ECN 110	Macro Economics	5			5	
		18	5		5	15

E. Provide a summary and classification of the courses comprising the program by quarter, assuming full-time enrollment. Provide subtotals of credit hours by quarter, by course type, and by total credit hours required.

SUMMARY AND CLASSIFICATION OF COURSES

LIMA TECHNICAL COLLEGE
Institution

ASPHALT & CONCRETE TECHNOLOGY
Associate Degree Program

12-22-95
Date

Course No.	Course Title	Clock Hours: Class	Clock Hours: Lab	Credit Hours: Basic	Credit Hours: Non-Tech	Credit Hours: Tech
Fifth						
ACT 232 or	Construction of Flexible Pavements	2				2
ACT 242	Construction of Rigid Pavements & Concrete Structures					
EET 292	Electrical-Electronic Systems	3	3			4
BUS 250	Critical Thinking & Problem Solving	5		5		
ACT 222	Surveying and Topography	3	2			4
QET 100	Fundamentals of Quality	3				3
		16	5	5		13
Sixth						
IFT 201	Safety, Health, and Environment	2	1			2
ACT 223	Construction Costs & Analysis	2				2
-	Technical Elective	5				5
COM 211	Public Speaking	5			5	
ACT 244	Design of Concrete Structures (Optional)	2				2
		17	1		5	11
		102	25	32	26	48

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